

11/09/2004

10/787,422

File 342:Derwent Patents Citation Indx 1978-04/200469

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S1 1 PN=US 6698378

SYSTEM:OS - DIALOG OneSearch.

File 350:Derwent WPIX 1963-2004/UD,UM &UP=200471

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*File 350: For more current information, include File 331 in your search.

Enter HELP NEWS 331 for details.

File 347:JAPIO Nov 1976-2004/Jul(Updated 041102)

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*File 347: JAPIO data problems with year 2000 records are now fixed.

Alerts have been run. See HELP NEWS 347 for details.

Set	Items	Description
S1	15	S1:S2
S2	3	S1 AND (DELIQUES? OR MELT? OR DISSOLV?)
S3	12	S1 NOT S2
S4	8	S3 AND (HUMID? OR DAMP?)
S5	4	S3 NOT S4

2/3,AB/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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007757840

WPI Acc No: 1989-022952/198903

XRAM Acc No: C89-010379

XRFX Acc No: N89-017538

Delayed action irreversible humidity sensor - using **deliquescent**
agent coated with water soluble dye protected by porous plastics carrier

Patent Assignee: AGM CARGO-TIES INC (AGMC-N); HUMIDIAL CORP (HUMI-N)

Inventor: BLINN J R; STEWART R K

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 4793180	A	19881227	US 84587369	A	19840308	198903 B

Priority Applications (No Type Date): US 81311391 A 19811014; US 84587369 A
19840308

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 4793180	A		6		

Abstract (Basic): US 4793180 A

Humidity indicator has a porous plastics carrier (16) with a recess (18) in its upper surface contg. a **deliquescent** agent coated with a water soluble dye (20), and a layer of absorbent sheet material (8) overlying the upper surface of the carrier directly above the dye coated agent (20). The carrier (16) is of such thickness and density to delay the passage of moisture from the lower surface which is exposed to an atmos. in a space being monitored for a time greater than that required to **dissolve** the **deliquescent** agent upon direct exposure to a moisture laden atmos. The upper surface of the device is isolated from the atmos. in the space being monitored.

USE/ADVANTAGE - Partic. when shipping or storing corrosion susceptible goods, such as electronic and military related equipment. Provides an irreversible humidity indicator with a delay which allows packaging and opening to replace or recharge a dissicant without the humidity indicator being triggered.

3/6

2/3,AB/2 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2004 Thomson Derwent. All rts. reserv.

001941152

WPI Acc No: 1978-H0419A/197836

Reversible humidity indicating device - includes pad and wick exposed to environment and containing **deliquescent** salts

Patent Assignee: MINNESOTA MINING CO (MINN)

Inventor: MANSKE W J

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 4098120	A	19780704				197836 B

Priority Applications (No Type Date): US 75584472 A 19750606

Abstract (Basic): US 4098120 A

A humidity indicating method involves a device suitable for visibly indicating exposure to a selected humidity level or for indicating a humidity-time history. The device comprises in combination a **deliquescent** cpd. a liquid absorbent wick, and an indicating system.

The change in properties of **deliquescent** cpds. are employed to indicate a particular humidity level or a humidity-time history. Preferred methods of making humidity indicating devices may involve the provision of letters which become visible in wet conditions. The letters disappear when the indicator is transferred to dry conditions.

2/3,AB/3 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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001405809

WPI Acc No: 1975-55516W/197533

Irreversible humidity indicator - of dry **deliquescent** salt film
carrying water-sol. dye film

Patent Assignee: US ATOMIC ENERGY COMMISSION (USAT)

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 3898172	A	19750805				197533 B

Priority Applications (No Type Date): US.73356863 A.19730503.

Abstract (Basic): US 3898172 A

Humidity indicator comprises a dry **deliquescent** salt adhered to a fused moisture-impervious substrate with fine dye particles of a water-sol. dye distributed on the upper surface of the dry salt. The dye provides an irreversible colour change on exposure to relative humidity levels of 6-20% at ambient temps. at which salt **deliquesces**. In a pref. embodiment, a number of diff. salt/dye combinations are provided on one substrate so that a permanent record of a max. humidity level is made, some salts having **deliquesced**, others not.

4/3,AB/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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014529876

WPI Acc No: 2002-350579/200238

XRPX Acc No: N02-275400

Timer for elapsed time measurement during semiconductor device manufacture, has substance-sensitive material patches whose color varies according to time of exposure to substance in controlled environment
Patent Assignee: MANI B (MANI-I); PATON E (PATO-I); ADVANCED MICRO DEVICES INC (ADMI)

Inventor: MANI B; PATON E

Number of Countries: 001 Number of Patents: 002

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 20020000184	A1	20020103	US 98199349	A	19981125	200238 B
US 6536370	B2	20030325	US 98199349	A	19981125	200325

Priority Applications (No Type Date): US 98199349 A 19981125

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
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US 20020000184	A1		8	G04F-001/00	
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US 6536370	B2			G01D-021/00	
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Abstract (Basic): US 20020000184 A1

Abstract (Basic):

NOVELTY - Substance-sensitive material patches (12A-12D) provided on a substrate (10) are exposed to a substance in a controlled environment such as semiconductor fabrication clean room. The color of the substance-sensitive material patches, varies according to the exposure time.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

(a) Timer calibration method;

(b) Elapsed time measurement method

USE - Timer e.g. humidity sensitive indicator used for measuring/monitoring elapsed time in controlled environment such as semiconductor fabrication clean room, during manufacture of semiconductor device such as submicron memory device.

ADVANTAGE - The timer provides a simple visual indication of the elapsed time between the critical manufacturing steps of semiconductor device and also provides an easily identifiable alarm signaling required for immediate action.

DESCRIPTION OF DRAWING(S) - The figure shows a schematic diagram of the timer.

Substrate (10)

Substance-sensitive material patches (12A-12D)

pp; 8 DwgNo 1/2

4/3,AB/2 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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012383192

WPI Acc No: 1999-189299/199916

XRPX Acc No: N99-138461

Packaging container for integrated circuits (ICs)

Patent Assignee: HUMIDIAL CORP (HUMI-N)

Inventor: BELTRAN M; MARTIN M

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 5875892	A	19990302	US 97781479	A	19970110	199916 B

Priority Applications (No Type Date): US 97781479 A 19970110

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5875892	A		12	B65D-085/00	

Abstract (Basic): US 5875892 A

Abstract (Basic):

NOVELTY - A packaging bag is formed by sealing the edges of a water and water vapor proof packaging material. A **humidity** indicator system (12) contains a **humidity** indicator (20) and a **humidity** comparator (22) which are sealed to an inner sealing ring and an outer sealing cap, which are sealed to an opening (18) in the bag.

USE - For ICs.

ADVANTAGE - Allows the moisture level within the packaging container to be easily determined without opening the container, and the ICs can be removed and treated if the moisture level is too high.

DESCRIPTION OF DRAWING(S) - The diagram shows an exploded view of the packaging container with the **humidity** indicator system.

Humidity indicator system (12)

Bag opening (18)

Humidity indicator (20)

Humidity comparator (22)

pp; 12 DwgNo 2/7

4/3,AB/3 (Item 3 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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009532575

WPI Acc No: 1993-226116/199328

XRAM Acc No: C93-100713

XRPX Acc No: N93-173564

Flexible **humidity** indicator for wall opening of electronic components packaging - has smaller sensing layer between transparent outer and vapour-permeable inner layers

Patent Assignee: WILLIAMS C A (WILL-I)

Inventor: WILLIAMS C A; WILLIAMS J M

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 5224373	A	19930706	US 91699312	A	19910509	199328 B

Priority Applications (No Type Date): US 91699312 A 19910509

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 5224373	A			G01W-001/00	

Abstract (Basic): US 5224373 A

Indicator comprises a sandwich of a transparent layer (14), a second layer (12) chemically treated to visually indicate **humidity** value and a third layer (13) permeable to water vapour but not particulates.

The layers are sealed together and the first and third extend beyond the second to form a mounting edge (15). The sensor is mounted in a container (C) with the third layer directed inwards. The second layer is pref. of blotting paper treated with cobalt chloride soln., or has areas responding to different **humidity** and carrying indicia. The third layer is pref. of flash spun film fibril high-density polyethylene. The container is pref. formed of sheet flash spun film fibril high-density polyethylene carrying a layer of aluminium and a layer of e.g., low-density polyethylene impervious to water vapour.

USE/ADVANTAGE - Partic. for packaging moisture-sensitive electronic components, provides direct indication and protects components against contamination.

Dwg.4/4

4/3,AB/4 (Item 4 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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008019624
WPI Acc No: 1989-284736/198939
XRAM Acc No: C89-126194
XRPX Acc No: N89-217328

Humidity indicator - measures relative **humidity** of paper sheets and surrounding air graduated temp. and **humidity** sensing strips

Patent Assignee: GLATT O G (GLAT-I)
Inventor: GLATT O G
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 4854160	A	19890808	US 88146855	A	19880122	198939 B

Priority Applications (No Type Date): US 88146855 A 19880122; US 878479 A 19870129

Patent Details:
Patent No Kind Lan Pg Main IPC Filing Notes
US 4854160 A 6

Abstract (Basic): US 4854160 A

Humidity indicating appts. (2) measures relative **humidity** of paper sheets and surrounding area, and comprises a first flat thin strip (3) having temp. sensors (6) which provide a graduated scale, and a second flat thin strip (5) which also provides a graduated scale of **humidity** by means of sensors (7), both scales being alongside a table (8) with rows and columns of relative **humidity** figures, and temp. and **humidity** scales on orthogonal axes.

Pref. temp. sensors (6) are liq. crystals which change colour with temp., and **humidity** sensors (7) are paper segments contg. inorganic salts which change colour with **humidity**, the indicator being inserted between paper sheets or into a roll to monitor paper printability.

ADVANTAGE - Registration or wrinkle problems are investigated before printing.

1/4

4/3,AB/5 (Item 5 from file: 350)
DIALOG(R)File 350:Derwent WPIX

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002237670

WPI Acc No: 1979-36862B/197919

Soil **humidity** indicator - with colour change inorganic salt
dispersed in permeable transparent plastics

Patent Assignee: FULLER D L (FULL-I)

Inventor: FULLER D L

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 4150570	A	19790424				197919 B

Priority Applications (No Type Date): US 77814898 A 19770712; US 76646038 A
19760102

Abstract (Basic): US 4150570 A

The indicator comprises transparent plastics with dispersed inorganic salt having a light transmission spectrum changing in response to RH changes. The plastics allows passage of moisture and has a greater affinity for the salt than the moisture so that the salt is not leached out. There is no internal reflection of visible light.

The plastics is pref. cellulose acetate, cellulose butyrate or cellulose acetate propionate, and the indicator may have a moisture impermeable transparent cover layer and a moisture permeable reflective backing layer.

4/3,AB/6 (Item 6 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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001851096

WPI Acc No: 1977-72119Y/197740

Container dial **humidity** indicator - with absorptive nylon operating
cords , viewing window and shock isolating hermetically sealing mounting

Patent Assignee: US SEC OF ARMY (USSA)

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 4050307	A	19770927				197740 B

Priority Applications (No Type Date): US 75610026 A 19750903

Abstract (Basic): US 4050307 A

A dial **humidity** indicator for attachment to a container, e.g. for military supplies, comprises a dial indicator and sensor unit for locating in the container, a sealed viewing window, and a mounting holding the assembly shock-isolated from and hermetically sealed to the container.

The unit pref. operates by means of two moisture-absorbing and expansible nylon cords which operate a pointer and can indicate extremes of himidity rapidly under extremes of temperature, shock and vibration. These assembly is pref. mounted by means of rubber washers and an O-ring

4/3,AB/7 (Item 7 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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001724193

WPI Acc No: 1977-G0686Y/197729

Digital relative **humidity** meter - uses set of optical filters made of inorganic salt compositions in transparent carrier in front of reflecting surface

Patent Assignee: FULLER D L (FULL-I)

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 4034609	A	19770712				197729 B

Priority Applications (No Type Date): US 76646038 A 19760102; US 77814898 A 19770712

Abstract (Basic): US 4034609 A

A multiple laminae **humidity** sensing devise is for visually indicating changes in relative **humidity**. It has a moisture impermeable transparent support layer having a viewing side and a sensing side opposite the viewing side.

An indicator layer has a number of filter cells, each including a transparent carrier material and an inorganic slat composition dispersed in the transparent carrier material that provides a known visible colour response to changes in relative **humidity** on the sensing side of the support layer and a moisture permeable reflective layer behind the indicator layer so that light passing through the support layer and the indicator layer is reflected back through the indicator layer and the support layer through the viewing side of the support layer so as to be readily visible from the viewing side of the support layer.

4/3,AB/8 (Item 8 from file: 350)

DIALOG(R)File 350:Derwent WPIX

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000892611

WPI Acc No: 1972-52645T/197233

Humidity sensor - for indicating **humidity** of a mass of moisture contg material

Patent Assignee: CARRIER RE (CAR -I)

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 3680364	A					197233 B

Priority Applications (No Type Date): US 7048280 A 19700622

Abstract (Basic): US 3680364 A

Base member, pref. of polymeric material, which is permeable to moisture and impermeable to bulk liquid is positioned in contact with a mass of material, esp. concrete, whose relative **humidity** is to be measured. An indicator which has a known visible response to relative **humidity** is positioned on the base member and covered with a transparent window, pref. of polymeric material, which is impermeable to moisture, and forms an enclosure about the indicator which is impermeable to moisture except through the base member. Pref. base member comprises a membrane of cellulose acetate, regenerated cellulose, ethyl cellulose, silicone rubber or nylon.

5/3,AB/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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012104455

WPI Acc No: 1998-521367/199844

XRPX Acc No: N98-407130

Indicator e.g. for displaying food product shelf time - has indicator
changing colour in response to temperature or extended time

Patent Assignee: GICS & VERMEE LP (GICS-N)

Inventor: GICS P W

Number of Countries: 081 Number of Patents: 003

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 9841829	A1	19980924	WO 98US4850	A	19980311	199844 B
AU 9864599	A	19981012	AU 9864599	A	19980311	199907
US 5997927	A	19991207	US 97819906	A	19970318	200004

Priority Applications (No Type Date): US 97819906 A 19970318

Patent Details:

Patent No	Kind	Lan	Pg	Main	IPC	Filing Notes
WO 9841829	A1	E	22	G01K-003/04		
Designated States (National): AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH GM GW HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG UZ VN YU ZW						
Designated States (Regional): AT BE CH DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG ZW						
AU 9864599	A			G01K-003/04		Based on patent WO 9841829
US 5997927	A			G01K-003/04		

Abstract (Basic): WO 9841829 A

Indicator changes visual appearance and has a nearby scale which depicts all the appearances that the indicator can display. A binary scale near both has two zones, the appearance of the indicator being matched to the appearance on the visual scale to create a matched area which is aligned in one of the zones.

The indicator changes colour when subjected to an environmental stimulus, the zones being red and green. A solid colour region aids in matching the indicator colour with the indicator scale colour.

USE - Indicator is for detecting whether or not a food product has been exposed to high temperature or undesirably long shelf-time.

ADVANTAGE - Indicator gives the consumer a clear indication of the freshness or suitability of products contained in a package.

Dwg.1/8

5/3,AB/2 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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011311488

WPI Acc No: 1997-289393/199726

XRAM Acc No: C97-093164

XRPX Acc No: N97-239612

Critically low temperature-indicating device for food, pharmaceuticals, vaccines etc. - comprises enclosed microporous membrane and indicating composition including mainly primary organic components and modifying and wetting components

Patent Assignee: MINNESOTA MINING & MFG CO (MINN); 3M INNOVATIVE

PROPERTIES CO (MINN)

Inventor: BIRKHOLZ R D; PEREYRA R J; SCHOLZ M T

Number of Countries: 075 Number of Patents: 008

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 9718449	A1	19970522	WO 96US17652	A	19961031	199726 B
AU 9676683	A	19970605	AU 9676683	A	19961031	199738
EP 861427	A1	19980902	EP 96939538	A	19961031	199839
			WO 96US17652	A	19961031	
BR 9611283	A	19990126	BR 9611283	A	19961031	199910
			WO 96US17652	A	19961031	
US 5964181	A	19991012	US 95558892	A	19951116	199949
JP 2000500575	W	20000118	WO 96US17652	A	19961031	200014
			JP 97518902	A	19961031	
EP 861427	B1	20020327	EP 96939538	A	19961031	200222
			WO 96US17652	A	19961031	
DE 69620217	E	20020502	DE 620217	A	19961031	200237
			EP 96939538	A	19961031	
			WO 96US17652	A	19961031	

Priority Applications (No Type Date): US 95558892 A-19951116

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
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WO 9718449	A1	E	44	G01K-011/06	
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Designated States (National): AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE HU IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK TJ TM TR TT UA UG UZ VN

Designated States (Regional): AT BE CH DE DK EA ES FI FR GB GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG

AU 9676683	A			G01K-011/06	Based on patent WO 9718449
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EP 861427	A1	E		G01K-011/06	Based on patent WO 9718449
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Designated States (Regional): BE CH DE FR GB IT LI

BR 9611283	A			G01K-011/06	Based on patent WO 9718449
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US 5964181	A			G01K-011/12	
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JP 2000500575	W		44	G01K-011/06	Based on patent WO 9718449
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EP 861427	B1	E		G01K-011/06	Based on patent WO 9718449
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Designated States (Regional): BE CH DE FR GB IT LI

DE 69620217	E			G01K-011/06	Based on patent EP 861427
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Based on patent WO 9718449

Abstract (Basic): WO 9718449 A

Critical temperature indicating device comprises: (a) a microporous membrane; and (b) an indicating composition containing <10 wt.% water and containment for the membrane and the composition. The indicating composition consists of: (i) a major amount of a primary organic component consisting of at least one compound that freezes above critical temperature and does not spontaneously wet out the membrane at a temperature at least 30 deg. C above critical temperature; (ii) a modifying component comprising at least one compound that freezes below critical temperature; and (iii) a wetting component comprising at least one compound that freezes below T and can spontaneously wet out the membrane at critical temperature. Components (i)-(iii) are miscible liquids above critical temperature and used in such ratio that the composition does not spontaneously wet out the membrane at a temperature at least 30 deg. C above critical temperature but does wet it out at critical temperature upon solidification of part of the composition.

USE - Used for indicating when objects e.g. flash frozen foods such as poultry, paints, water-based adhesives and chemicals, dairy

products, plants, pharmaceuticals and vaccines have been exposed to an undesirably low temperature.

ADVANTAGE - Indicating composition can have a response time of at most 30 minutes, can be activated within plus or minus 1 deg. C of critical temperature and can be modified to cover a wide range of critical temperature.

Dwg.1/4

5/3,AB/3 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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003035258

WPI Acc No: 1981-D5272D/198116

Plant watering indicator device - has hygroscopic alkali indicator on elongate plate for insertion into soil

Patent Assignee: MARTIN C (MART-I)

Inventor: MARTIN C

Number of Countries: 002 Number of Patents: 003

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
GB 2059077	A	19810415	GB 8030539	A	19800922	198116 B
US 4382380	A	19830510				198321
GB 2059077	B	19840125				198404

Priority Applications (No Type Date): GB 8030539 A 19800922; GB 7933394 A 19790926

Abstract (Basic): GB 2059077 A

The device comprises an elongate member (11) which is insertable into soil and has a layer (14) of hygroscopic material, calcium hydroxide, disposed upon it. At the end of the member not inserted into the soil, there is a transparent plastic coloured film (16) which covers the calcium hydroxide layer and seals the layer by means of tape pieces (18).

There is a gap (19) in the layer disposed beneath the plastic film. In use the indicator is inserted into the soil and, if sufficient water is present, the water is attracted up between the film and the member and the calcium hydroxide changes from opaque to translucent. The colour of the member is contrasted against the colour of film above the gap, giving a visual indication of the water content.

Abstract (Equivalent): GB 2059077 B

The device comprises an elongate member (11) which is insertable into soil and has a layer (14) of hygroscopic material, calcium hydroxide, disposed upon it. At the end of the member not inserted into the soil, there is a transparent plastic coloured film (16) which covers the calcium hydroxide layer and seals the layer by means of tape pieces (18).

There is a gap (19) in the layer disposed beneath the plastic film. In use the indicator is inserted into the soil and, if sufficient water is present, the water is attracted up between the film and the member and the calcium hydroxide changes from opaque to translucent. The colour of the member is contrasted against the colour of film above the gap, giving a visual indication of the water content.

5/3,AB/4 (Item 4 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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002523367

WPI Acc No: 1980-41396C/198023

Fire-fighters hazardous atmosphere indicator badge - with colour change elements held between apertured packing and substrate

Patent Assignee: ESCH V H (ESCH-I)

Inventor: FRISTROM R M

Number of Countries: 001 Number of Patents: 001

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 4205043	A	19800527				198023 B

Priority Applications (No Type Date): US 78902963 A 19780504

Abstract (Basic): US 4205043 A

Badge has colour-change elements to indicate time and concn. exposures located over the back of a substrate with smaller apertures by an adherent backing, and pressure-sensitive tape adhered over the front of the substrate to be removed by a non-adhesive pull tab when the badge is to be used.

The badge is attached by a clip having elongate edges supporting substrate edges and supporting clip loops extending from one end of each edge to engage the clothing. The tab extends from the substrate adjacent the loops. The elements pref. change colour in sequence and each is initially green, then changing to aronage and further to red. The badge is e.g. for detection of HCl in a PVC fire, when the elements are strips impregnated with universal indicator.